Notice of Allowability	Application No.	Applicant(s)	
	10/733,630	BIRAN ET AL.	
	Examiner	Art Unit	
	Quang N. Nguyen	2141	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *the Amendment filed on 09/15/2006*.

2. ☒ The allowed claim(s) is/are *1-3,5-7,9,10,12-14,16,17,19 and 20*.

3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
   a) ☐ All b) ☐ Some* c) ☐ None of the:
      1. ☐ Certified copies of the priority documents have been received.
      2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
      3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
   (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .
7. ☒ Examiner's Amendment/Comment
8. ☐ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

RUPAL DHARIA
SUPERVISORY PATENT EXAMINER

Examiner's Amendment

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

2. Authorization for this Examiner's Amendment was given in a telephone interview with the Applicant's Representative, Mr. Spencer K. Warnick (Reg. No. 40,398), on October 16th, 2006.

3. Please cancel claims 4, 8, 11, 15 and 18.

4. Please amend claims 1, 7 and 14 as below:

Claim 1. (Currently amended) A method of increasing transmission control protocol (TCP) re-transmission process speed, the method comprising ~~the steps of~~:

receiving a TCP segment from a transmitter;

generating a first duplicate TCP acknowledgement (Ack) covering [[a]] **the** received TCP segment that is determined to be valid by ~~a local~~ TCP and was dropped by ~~the local~~ TCP based on an upper layer protocol (ULP) decision; and

transmitting the first duplicate TCP Ack **to the transmitter,**

wherein the first duplicate TCP Ack is generated and transmitted even in the case that a next in-order TCP segment has not been received to bring the re-transmission process forward by speeding up a process of re-entering the transmitter to a fast path mode.

Claim 7. (Currently amended) A system of increasing transmission control protocol (TCP) re-transmission process speed, the system comprising:

means for receiving a TCP segment from a transmitter;

a TCP acknowledgement (Ack) generator to generate a first duplicate TCP Ack covering [[a]] **the** received TCP segment that is determined to be valid by ~~a local~~ TCP and was dropped by ~~the local~~ TCP based on an upper layer protocol (ULP) decision; **and**

means for transmitting the first duplicate TCP Ack to the transmitter,

wherein the first duplicate TCP Ack is generated and transmitted even in the case that a next in-order TCP segment has not been received to bring the re-transmission process forward by speeding up a process of re-entering the transmitter to a fast path mode.

Claim 14. (Currently amended) A computer program product comprising a computer ~~useable~~ **readable storage** medium having computer readable program code embodied therein for increasing transmission control protocol (TCP) re-transmission process speed, the **computer** program product comprising:

program code configured to receive a TCP segment from a transmitter;

program code configured to generate a first duplicate TCP acknowledgement (Ack) covering [[a]] **the** received TCP segment that is determined to be valid by ~~a local~~ TCP and was dropped by ~~the local~~ TCP based on an upper layer protocol (ULP) decision**; and**

program code configured to transmit the first duplicate TCP Ack to the transmitter,

wherein the first duplicate TCP Ack is generated and transmitted even in the case that a next in-order TCP segment has not been received to bring the re-transmission process forward by speeding up a process of re-entering the transmitter to a fast path mode.

5. Claims 1-3, 5-7, 9, 10, 12-14, 16, 17, 19 and 20 are allowed.

6. The following is an examiner's statement of reasons for allowance:

In interpreting the claims, in light of the specification and the applicant's arguments filed on 09/15/2006, the Examiner finds the claimed invention to be patentably distinct from the prior art of records.

Pazos (US 2005/0068896) teaches a system and method for transmission control protocol (TCP) acceleration, wherein a TCP receiver issues a duplicate acknowledgement (ACK) whenever an out-of-order segment arrives. Hence, all packets received after a lost packet will trigger duplicate ACKs. If packets are not lost, but are

simply received out-of-order, some duplicate ACKs will result. The destination saves these out-of-order packets, which gives rise to gaps in the stream of sequence number received. When eventually an in-order packet fills a gap, the destination will send a new ACK containing the sequence number that indicates receipt of all the in-order packets received, with no gaps till that sequence number **(Pazos, paragraph [0007])**.

Elzur (US 2003/072342 A1) teaches a system and method for identifying upper layer protocol (ULP) message boundaries, wherein a TCP frame 50 sent by a transmitter 10 may be received in-order or out-of-order by a receiver 30, which may compute the CRC (in step 290) and determine whether the CRC is valid. In query 300, if the CRC does not match per check done by the receiver 30, then in query 360, if the framing layer CRC checking takes place before the TCP layer processing is done, then in step 380, the receiver 30 may silently drop the TCP segment *(i.e., the received TCP segment was dropped based on the result of CRC check, hence, based on an upper layer protocol ULP decision)* and allow the TCP layer recovery mechanism to retransmit it **(Elzur, paragraph [0050])**.

However, the prior art of records fail to teach individually or in combination and/or render obvious that a computer system and method of increasing transmission control protocol (TCP) re-transmission process speed, the system comprising: means for receiving a TCP segment from a transmitter; **a TCP acknowledgement (Ack) generator to generate a first duplicate TCP Ack covering the received TCP segment that is determined to be valid by TCP and was dropped by TCP based on an upper layer protocol (ULP) decision**; and means for transmitting the first duplicate

TCP Ack to the transmitter, **wherein the first duplicate TCP Ack is generated and transmitted even in the case that a next in-order TCP segment has not been received to bring the re-transmission process forward by speeding up a process of re-entering the transmitter to a fast path mode** as set forth in independent claims 1, 7 and 14. Claims 1-3, 5-7, 9, 10, 12-14, 16, 17, 19 and 20 are allowed because of the combination of other limitations and the limitations listed above.

The examiner finds the Applicant's arguments on pages 7-9 of the Remarks filed on 09/15/2006 to be persuasive. The Applicant argued in substance that the combination of prior art of records fail to disclose the features of the invention including *generating a first duplicate TCP Ack covering the received TCP segment that is determined to be valid by TCP and was dropped by TCP based on an upper layer protocol (ULP) decision, wherein the first duplicate TCP Ack is generated and transmitted even in the case that a next in-order TCP segment has not been received to bring the re-transmission process forward by speeding up a process of re-entering the transmitter to a fast path mode*, as claimed in the invention to allow the system to speed up a process of re-entering the transmitter to the fast path mode by generating and transmitting a duplicate TCP Ack for a received TCP segment (e.g., segment A) even in the case that a next in-order segment (e.g., segment B) has not been received to let the transmitter know that segment A, a valid TCP segment, was received and dropped due to ULP considerations, hence as a result, the additional duplicate Ack forces the transmitter to begin retransmit procedure earlier where a number of duplicate Acks must be received before retransmission begins **(see Remarks filed on 09/15/2006, pages 7-**

9 and see Specification, section D. "Speeding up TCP Retransmit Process", paragraphs [0085 – 0087]).

7. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should clearly labeled "Comments on Examiner's Amendment".

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Quang N. Nguyen whose telephone number is (571) 272-3886.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's SPE, Rupal Dharia, can be reached at (571) 272-3880. The fax phone number for the organization is (703) 872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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SUPERVISORY PATENT EXAMINER